DOCUMENT RESUME

ED 104 544 PS 007 773

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| AUTHOR | Leler, Hazel; And Others |
| TITLE | A Parent Involvement Program for Low-Income Mexican-American Families. |
| INSTITUTION | Houston Univ., Tex. Dept. of Psychology. |
| SPONS AGENCY | Office of Child Development (DHEW), Washington, D.C.; Office of Economic Opportunity, Washington, D.C. |
| PUB DATE | 1 Sep 74 |
| NOTE | 48p.; Paper presented at the Annual Meeting of the American Psychological Association (82nd, New Orleans, La., Sept. 1, 1974); Filmed from best copy available |
| EDRS PRICE | MF-$0.76 HC-$1.95 PLUS POSTAGE |
| DESCRIPTORS | Correlation; Data Analysis; Evaluation Methods; Home Programs; *Longitudinal Studies; Low Income Groups; Measurement Techniques; *Mexican Americans; Parent Child Relationship; *Parent Education; Pilot Projects; Program Descriptions; *Program Evaluation; Research Design; Standardized Tests |

ABSTRACT

This symposium report summarizes three studies from the Houston Parent-Child Development Center dealing with aspects of a Parent Involvement Program for low-income Mexican-American families. The studies reviewed are: (1) First Results of a Longitudinal Parent Education Program, (2) Prediction of Success in a Parent Education Program, (3) Concurrent and Longitudinal Relationships between Mother and Child Variables. The first paper presents a brief description of the experimental design and the evaluation measures used in the Houston PCDC model program, followed by a listing of some initial results based on a preliminary analysis of the data. The second paper discusses which participants benefited most from the parent education program by examining the relationships between a set of baseline or demographic variables (predictor variables) and a set of evaluative measures (outcome variables). In the third study, four sets of data are presented: first, the stability of mother and child measures over 1-year periods; second, the concurrent and longitudinal relationships within the set of child variables over one or two years; third, concurrent and longitudinal relationships within the set of mother variables over one or two years; and finally, the concurrent and longitudinal relationships between child and mother variables. (CS)

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# UNIVERSITY OF HOUSTON

# PARENT–CHILD

## DEVELOPMENT CENTER

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This research is supported by Grant #CG 60925 issued to the Harris County Community Action Association by the Office of Economic Opportunity. In July, 1973, the research project was transferred to the Office of Child Development, Department of Health, Education, and Welfare.

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# A PARENT INVOLVEMENT PROGRAM

# FOR LOW-INCOME MEXICAN-AMERICAN FAMILIES

Chairperson: Dale L. Johnson, Parent-Child Development Center, University of Houston, Houston, Texas.

Participants:

Hazel Leler, Parent-Child Development Center, University of Houston, Houston, Texas: First Results of Longitudinal Parent Education Program

Larry J. Brandt, Parent-Child Development Center, University of Houston, Houston, Texas: Prediction of Success in a Parent-Education Program

Alfred J. Kahn, Parent-Child Development Center, University of Houston, Houston, Texas: Concurrent and Longitudinal Relationships between Mother and Child Variables

Discussant:

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Symposium

Presented at

American Psychological Association

Annual Meeting

New Orleans, Louisiana

September 1, 1974

This research is supported by Grant #CG 60925 issued to the Harris County Community Action Association by the Office of Economic Opportunity. In July, 1973, the research project was transferred to the Office of Child Development, Department of Health, Education, and Welfare.

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# FIRST RESULTS OF LONGITUDINAL PARENT EDUCATION PROGRAM

Hazel Leler

Parent-Child Development Center

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# FIRST RESULTS OF A LONGITUDINAL PARENT EDUCATION MODEL

Hazel Leler

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It has always been difficult to be an effective parent, but fulfilling this function competently today is a more demanding job than ever. It is even more difficult for the low-income parent, who has limited access to resources enjoyed by more privileged groups, or who is overwhelmed with the elemental struggle for bread. The Houston Parent-Child Development Center, seeking to develop a parent education model, chose to focus upon the Mexican-American population Perhaps the most compelling reason for this choice lay in the Housto school survey which reported that the dropout rate for Mexican-Americans in Houston schools was higher than 88%. This makes it imperative for the Mexican-American parent to gain access to resources needed to work with his child and the schools. The effort is not merely to help the child meet the demands of the school (we call this "survival training"), but more importantly that the school be helped to meet the child's needs.

Our objectives have been, then, to help the family gain access to resources the parent can use to develop his abilities and confidence to be an effective change agent for his family, and to increase his skills and understandings in meeting his child's needs.

## Program

What is the Houston model? How has it sought to make these resources available to families?

During the first program year when the target child is one year of age, an In-Home Educator visits the home weekly. A sharing approach is attempted, with the Educator drawing out the mother's knowledge and experience, sometimes contributing her own, in discussions and activities focused upon the mother's skill as the

teacher of her child. The move has been away from the Educator as model (or "expert") to a situation in which the mother is encouraged to interact with her child, the Educator reinforcing and extending.

During this first program year, the entire family is involved in socials and Family Workshops. Formerly held at a residential retreat center, the Workshop has shifted to center-based one-day weekend events. Each family is invited to a series of four. The focus is upon strengthening the family unit, with disucssions and activities emphasizing communication, decision-making, problem-solving, and role-relationships within the family itself and as the family relates to the community.

During the second program year, when the child is two, mother and child attend an In-Center program four mornings each week. The children's classrooms focus upon cognitive development (including Palmer's Concept Curriculum), language and self-concept development. The mothers sometimes work in the children's classrooms, sometimes engage in adult sessions. Half of these sessions are geared to increasing the mother's competence in managing her family's resources in such areas as nutrition, cooking, budgeting, sewing, health, and driver education. Half are geared to child development and learning. Use is made of microteaching, a powerful technique by which parents can improve their teaching skills. Each mother and child dyad is videotaped interacting with educational materials in which the mother attempts to promote the child's exploration and enjoyment of learning. She views this tape for self-feedback, and then, with her permission, it is shown to the other mothers. Discussion is limited to positive feedback. Both fathers and mothers have been excited in seeing the progress on the videotapes. Evening sessions are held twice monthly for parents, the fathers then having their turn to choose the topics which range from consumer buying to public school relationships.

Bilingual language activities are central. In the In-Home year, language stimulation techniques are stressed, with the mother urged

to interact with the child in the language in which she is most comfortable. The In-Center teachers speak to the two-year-old in his dominant language, Spanish or English, since he is just beginning to master it. This provides a natural bilingual environment, with the child hearing and beginning to grasp both languages. The parents conduct most adult activities in Spanish, moving to English as they desire. English language classes are offered both program years to enhance the mothers' contacts with the community and schools. A special effort is made to include English terms in home management activities.

Access to community resources is facilitated. Families are encouraged to enroll in the local community health clinic where each target child is given a medical examination with pertinent tests and followup. In addition, families can consult community workers about various problems and are referred to appropriate agencies for such needs as food stamps, legal aid, and counseling. A Parent Advisory Council, elected from among the two program year groups, provides input regarding community needs and program changes desired.

Design and Measures

How has the Houston PCDC model been tested? What measures are used?

A brief description will be made of the experimental design and approach to evaluation. Each year a group of families is recruited (primarily door-to-door) and enrolled in the project. This annual group is referred to as a cohort and consists of approximately 100 families. Families in each cohort are randomly assigned monthly to the Experimental group (receiving educational program and community services), to the Services Control group (receiving services only), or to the No-Services Control group. Proportions assigned to groups have varied each month to achieve desired sample sizes. Data are collected on mother and child measures at child ages one year (Time 1, enrollment), two years (Time 2, after In-Home program), three

years (Time 3, after In-Center program), and followup at yearly intervals (Time 4 at age 4, etc.).

In its pilot phase, Cohorts A, B, and C experienced early program components as they developed. The model-testing phase actually began with Cohorts D and E. In late 1971, Group D Experimental was enrolled in In-Home to progress through the planned two-year program. Group E Experimental with two-year-olds was enrolled in In-Center or second-year program so that this part of the model could be developed. Cohort D families completed the two-year program last year; Cohort F has completed the first In-Home year, and Cohort G is midway through the In-Home year.

Those of you who have been involved in developing a long-term program-research model with accompanying curriculum and procedures, and testing it with existing measures or those developed for the purpose must know the frustrations of reporting at a point where one cannot put his best foot forward. The best test of a program is in followup results from the completely developed curriculum. However, results reported now pertain to Cohorts D, E, and F, when the curriculum was relatively undeveloped and the staff relatively untrained. Mothers did not participate in microteaching more than twice until this past year. Some of our most appropriate measures, such as mothers' self-concept, had yet to be developed.

Since the program focuses on building upon the mothers' strengths, our primary measures focus here also. We rely heavily upon a videotaped mother-child interaction sequence which gives measures of both mother and child performance. This gives a general picture of mother-child behavior, but we view it principally as a criterion measure because so much of the program is concerned with style of mother-child interaction. Called the Maternal Interaction Structured Situation (MISS), at first it focused primarily upon the mother's control (autonomy granting) and affect dimensions. Last year rating scales were added which assess such behaviors as the

mother's affection, use of reinforcement, reasoning, etc. The videotapes were scored by trained observers with scoring reliable at or above the 80% level.

Caldwell's structured observation and interview technique, HOME, is used to determine the kind of learning environment the mother provides her young child. This offers reliable scores about the home environment, but its validity as a measure of change is not known. HOME offers a total score and six sub-scores.

Engel's Psychological Mindedness interview is used to assess the mother's attitudes toward children and way of conceptualizing the behavior of young children and mother-child interaction. It has three subscales: Affective Responsiveness, Developmental Change, and Behavior Shaping.

Educator's Report Forms are used by In-Home Educators to assess mother and child behaviors. Although less objective than the other measures in that data are collected by program staff, they add more specific information. Data on the mothers' language were also collected but have not yet been analyzed.

Child measures, administered in the child's dominant language, include the Bayley Infant Scales of Development at age one and two years (Times 1 and 2); the Stanford-Binet administered at age 3 (Time 3); and Palmer's Concept Familiarity Index (CFI) administered at age 3 (Time 3). Mazeika's Receptive Language Index has been administered but data are not completely analyzed. Child behaviors were also assessed on the MISS and the Educator's Report Forms, but little of these data are completely analyzed.

Process measures for quality control and program feedback have also been developed but are too extensive for reporting here.

## Results

How well has the Houston PCDC met its goals to date? How effective has the program been in meeting needs?

Tables 1 and 2 give results on the Maternal Interaction Structured Situation (MISS) for Cohort E (second-year program group only). Experimental mothers showed a significant ($p < .01$) increase (pre-post) on the control dimension, that is, in their ability to grant autonomy or tolerate the independence of their children. Their increase (pre-post) in the provision of warmth and security for their children was not significant, probably because mothers generally show less warmth as children grow older. Experimental mothers were significantly more autonomy granting ($p < .01$) and warmer ($p < .05$) than Control mothers.

Preliminary analysis (no Tables) of the new scales added to the MISS for Cohort D (Time 3) indicated positive effects on the Reinforcement or Praise dimension. Experimental mothers increased their use of praise while Control mothers decreased their use. Experimental mothers also showed significantly more affection than Control mothers at the end of the program (Time 3).

Results on the HOME Inventory (Table 3) for Cohort E (second-year program only) indicated that Sub-sections 5 and 6 showed significant differences between Experimental and Control mothers but the other four sub-sections and the total score showed no differences. Experimental mothers provided more appropriate play materials ($p < .05$) and were more involved with their children ($p < .05$). On Cohort D (Table 4) Sub-section 2, a difference was found favoring Control mothers with the Controls demonstrating less avoidance of restriction and punishment than Experimental mothers ($p < .05$). On Cohort F, preliminary analysis indicated no significant differences between Experimental and Control mothers from Time 1 to 2.

Tables 5A, 5B, and 5C present results of the Psychological Mindedness measure for Cohort D. Experimental mothers exceeded Control mothers ($p < .05$) on the Developmental Change scale, that is, in their knowledge of the developmental level of children. The Behavior Shaping scale showed a positive trend and the Affective Responsiveness scale showed no differences. No results are available for Cohorts E and F.

Results from the Educator's Report Forms (Tables 6 and 7) indicated positive changes in mother and child for the most part and served to confirm the more objective results.

Turning now to the child measures, we see more short-term results. Tables 8-12 present data from the various cognitive measures. Experimental children were more developmentally advanced than Control children on the Mental Development Index (MDI) of the Bayley Scales of Infant Development for Cohort D ($p < .05$) and Cohort F ($p < .01$) after one year in the program (Time 2), (see Tables 8 and 9). The only significant difference on the Stanford-Binet (Tables 10-12) was for Cohort E (second-year program only) in which the Experimental children were significantly higher ($p < .01$ than the Controls at age 3 (Time 3). The difference for Cohort D was nonsignificant, and Cohort F results are not yet available. On the Concept Familiarity Index (CFI, Tables 11-12) significant differences ($p < .05$) were found at Time 3 for both Cohorts D and E. Educator's Report Form ratings of child performance indicated significant improvement ($p < .01$) in the child behaviors of independence and competence for Cohort D (Table 8).

In general, it seems that short-term results on children's cognitive measures were the most readily achieved. Mothers apparently made behavior changes in response to specific program curriculum and procedures, but more general behaviors and attitudes were more resistant to change. Sometimes Experimental mothers' scores increased but this varied with measures and cohorts. There was little consistence, except on the more specific criterion measure of behavior. We realize that the mother's behavior change in teaching and interacting skill is probably the most productive of long-term child success, so that we view these mother changes as extremely important in the test of the model. Complete results from Cohort F and preliminary results from Cohort G will be available before replications of our PCDC model get underway in late 1975.

TABLE 1

MATERNAL INTERACTION STRUCTURED SAMPLE (MISS): DISTRIBUTION OF MATERNAL BEHAVIOR IN CATEGORIES WITHIN DIMENSIONS (COHORT E)

| Category | Mean Frequency | | | | | | Mean Percentages | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $E_E T_2$ | | $E_E T_3$ | | $E_C T_3$ | | $E_E T_2$ | | $E_E T_3$ | | $E_C T_3$ | |
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Control Dimension | | | | | | | | | | | | |
| Autonomy granting | 63.6 | 18.9 | 96.4 | 22.6 | 70.7 | 28.2 | 32.3 | 8.7 | 42.2 | 14.8 | 34.5 | 10.5 |
| Structuring | 105.2 | 30.4 | 111.8 | 30.4 | 111.8 | 16.1 | 52.9 | 10.9 | 54.8 | 13.7 | 57.0 | 8.9 |
| Intrusive structuring | 27.4 | 15.5 | 5.2 | 3.8 | 15.8 | 8.9 | 14.1 | 7.7 | 2.7 | 2.9 | 8.2 | 5.8 |
| Coercive Control | 1.0 | 1.4 | 0.1 | 0.5 | 0.2 | 0.8 | 0.5 | 0.8 | 0.1 | 0.5 | 0.1 | 0.5 |
| Total | 197.2 | 31.7 | 213.6 | 35.5 | 198.5 | 32.1 | | | | | | |
| Affect Dimension | | | | | | | | | | | | |
| Warm, sensitive | 33.4 | 20.8 | 40.9 | 21.6 | 14.9 | 9.4 | 16.3 | 8.5 | 18.5 | 8.9 | 7.6 | 5.0 |
| Neutral | 152.5 | 25.2 | 165.4 | 30.1 | 175.4 | 31.2 | 77.6 | 8.1 | 77.7 | 9.7 | 88.2 | 4.3 |
| Preoccupied | 5.4 | 5.9 | 4.2 | 3.9 | 4.7 | 5.9 | 3.0 | 3.4 | 2.0 | 2.0 | 2.3 | 2.7 |
| Negative | 5.8 | 5.6 | 3.0 | 4.2 | 3.5 | 6.0 | 2.9 | 2.6 | 1.5 | 2.5 | 1.8 | 2.7 |
| Total | 197.1 | 32.0 | 213.6 | 35.5 | 198.5 | 32.1 | | | | | | |

Note: Sample Sizes: $E_E = 16$; $E_C = 14$

TABLE 2

MATERNAL INTERACTION STRUCTURED SAMPLE (MISS):P

WEIGHTED SCORES ON CONTROL AND AFFECT DIMENSIONS

(COHORT E)

A. Group $E_E$: Pre-Post Comparison

| Dimension | $T_2$ | | | $T_3$ | | | $T_3-T_2$ | |
|---|---|---|---|---|---|---|---|---|
| | N | Mean | SD | N | Mean | SD | Difference | t |
| Control | 16 | 3.171 | .133 | 16 | 3.425 | .114 | .254 | 6.68* |
| Affect | 16 | 3.075 | .125 | 16 | 3.134 | .106 | .059 | 1.88 |

B. Group Comparison: Post Only

| Dimension | $E_E$ | | | $E_C$ | | | $E_E-E_C$ | |
|---|---|---|---|---|---|---|---|---|
| | N | Mean | SD | N | Mean | SD | Difference | t |
| Control | 16 | 3.425 | .114 | 14 | 3.251 | .142 | .174 | 3.39** |
| Affect | 16 | 3.134 | .106 | 14 | 3.026 | .102 | .108 | 2.74* |

*p <.05 **p <.01

Note: Weighted Scores for each subject were derived by multiplying the frequency for each category by the weight assigned to that category, summing the products, and dividing by the total frequenc

$$WS_C = \frac{4\ (f_{AG}) + 3\ (f_S) + 2\ (f_{IS}) + 1\ (f_{CC})}{f_T}$$

$WS_C$ = Weighted Score for Control Dimension

$f_{AG}$ = Frequency of Autonomy Granting

$f_S$ = Frequency of Structuring

$f_{IS}$ = Frequency of Intrusive Structuring

$f_{CC}$ = Frequency of Coercive Control

$f_T$ = Total Frequency

$$WS_A = \frac{4\ (f_W) + 3\ (f_N) + 2\ (f_P) + 1\ (f_{NEG})}{f_N}$$

$WS_A$ = Weighted Score for Affect Dimension

$f_W$ = Frequency of Warm, Sensitive

$f_N$ = Frequency of Neutral

$f_P$ = Frequency of Preoccupied

$f_{NEG}$= Frequency of Negative

$f_T$ = Total Frequency



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TABLE 3

POST-TEST RESULTS OF THE HOME INVENTORY FOR MOTHERS PARTICIPATING IN THE SECOND YEAR PROGRAM

(COHORT E)

| Measure | $E_E$ | | $E_C$ | | Difference | t |
|---|---|---|---|---|---|---|
| | N | Mean | N | Mean | | |
| HOME, T3 | | | | | | |
| Category 1 | 13 | 6.85 | 17 | 6.65 | 0.20 | 0.30 |
| Category 2 | 13 | 5.69 | 17 | 5.71 | -0.02 | -0.21 |
| Category 3 | 13 | 4.54 | 17 | 3.94 | 0.60 | 1.20 |
| Category 4 | 13 | 4.23 | 17 | 2.47 | 1.76 | 2.28* |
| Catcgory 5 | 13 | 2.92 | 17 | 1.47 | 1.45 | 2.32* |
| Category 6 | 13 | 3.15 | 17 | 2.24 | 0.91 | 1.67 |
| Total | 13 | 27.38 | 17 | 22.24 | 5.14 | 1.86 ($p < .10$) |

*$p < .05$

Categories:

1. Emotional and Verbal Responsivity of Mother
2. Avoidance of Restriction and Punishment
3. Organization of Environment
4. Provision of Appropriate Play Materials
5. Maternal Involvement with the Child
6. Opportunities for Variety in Daily Routine

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TABLE 4

HOME INVENTORY RESULTS FOR MOTHERS

AT TWO DATA POINTS FOR TIME 3 SUBJECTS ONLY

(COHORT D)

| Measure | $D_E$ | | | $D_C$ | | | Difference | t |
|---|---|---|---|---|---|---|---|---|
| | N | Mean | SD | N | Mean | SD | | |
| Home, $T_2$ | | | | | | | | |
| Category | | | | | | | | |
| 1 | 20 | 8.0 | 2.7 | 23 | 7.7 | 2.1 | + .3 | 0.48 |
| 2 | 20 | 5.5 | 1.1 | 23 | 5.4 | 1.2 | + .1 | 0.30 |
| 3 | 20 | 4.8 | 0.9 | 23 | 4.3 | 1.3 | + .5 | 1.42 |
| 4 | 20 | 5.0 | 1.6 | 23 | 5.0 | 2.0 | 0.0 | 0.00 |
| 5 | 20 | 2.4 | 1.4 | 23 | 3.2 | 1.5 | - .8 | -1.79 |
| 6 | 20 | 3.2 | 1.3 | 23 | 3.1 | 1.0 | + .1 | 0.32 |
| Total | 20 | 29.0 | 4.5 | 23 | 28.6 | 5.0 | + .4 | 0.22 |
| Home, $T_3$ | | | | | | | | |
| Category | | | | | | | | |
| 1 | 18 | 9.9 | 1.2 | 24 | 9.3 | 1.3 | + .6 | 1.51 |
| 2 | 18 | 5.6 | 1.7 | 24 | 6.5 | 1.1 | - .9 | -2.07 |
| 3 | 18 | 5.4 | 0.8 | 24 | 5.4 | 0.8 | 0.0 | 0.00 |
| 4 | 18 | 6.2 | 1.9 | 24 | 6.1 | 2.4 | + .1 | 0.20 |
| 5 | 18 | 3.7 | 1.2 | 24 | 3.9 | 1.6 | - .2 | -0.33 |
| 6 | 18 | 3.2 | 1.0 | 24 | 2.8 | 1.2 | + .4 | 1.05 |
| Total | 18 | 33.9 | 4.6 | 24 | 33.9 | 5.2 | 0.0 | 0.00 |

* $p < .05$

Categories:

1. Emotional and Verbal Responsivity of Mother
2. Avoidance of Restriction and Punishment
3. Organization of Environment
4. Provision of Appropriate Play Materials
5. Maternal Involvement with the Child
6. Opportunities for Variety in Daily Routine

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TABLE 5A

PSYCHOLOGICAL MINDEDNESS RESULTS AT TIME 2 AND TIME 3

FOR TIME 3 SUBJECTS ONLY

AFFECTIVE RESPONSIVENESS

(COHORT D)

Cell Means.

| | | $T_2$ | $T_3$ | $\bar{X}$ | SD | N |
|---|---|---|---|---|---|---|
| Group | $D_E$ | 3.64 | 3.34 | 3.49 | (.62) | 17 |
| | $D_C$ | 3.67 | 3.31 | 3.49 | (.32) | 18 |
| | | 3.66 | 3.32 | | | |

Analysis of Variance Summary Table

| Source | DF | SS | MS | F |
|---|---|---|---|---|
| Between | | | | |
| Group | 1 | .000 | .000 | .000 |
| Error (B) | 33 | 17.065 | .517 | |
| Within | | | | |
| Time | 1 | 1.932 | 1.932 | 6.640* |
| Group X Time | 1 | .014 | .014 | .049 |
| Error (W) | 33 | 9.603 | .291 | |
| Total | 69 | 28.614 | .415 | |

*$p < .05$

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TABLE 53

PSYCHOLOGICAL MINDEDNESS RESULTS AT TIME 2 AND TIME 3

FOR TIME 3 SUBJECTS ONLY

DEVELOPMENTAL CHANGE

(COHORT D)

Cell Means

| | | $T_2$ | $T_3$ | $\bar{X}$ | SD | N |
|---|---|---|---|---|---|---|
| GROUP | $D_E$ | 2.54 | 2.61 | 2.58 | ( .48) | 17 |
| | $D_C$ | 2.72 | 2.29 | 2.51 | ( .30) | 18 |
| | | 2.63 | 2.45 | | | |

ANalysis of Variance Summary Table

| Source | DF | SS | MS | F |
|---|---|---|---|---|
| Between | | | | |
| Group | 1 | .084 | .084 | .249 |
| Error (B) | 33 | 11.168 | .338 | |
| Within | | | | |
| Time | 1 | .583 | .583 | 2.686 |
| Group X Time | 1 | 1.094 | 1.094 | 5.038* |
| Error (W) | 33 | 7.167 | .217 | |
| Total | 69 | 20.096 | .291 | |

*$P < .05$

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TABLE 5C

PSYCHOLOGICAL MINDEDNESS RESULTS AT TIME 2 AND TIME 3

FOR TIME 3 SUBJECTS ONLY

BEHAVIOR SHAPING

(COHORT D)

Cell Means

| | | $T_2$ | $T_3$ | $\bar{X}$ | SD | N |
|---|---|---|---|---|---|---|
| GROUP | $D_E$ | 3.58 | 3.87 | 3.72 | ( .59) | 17 |
| | $D_C$ | 3.69 | 3.68 | 3.68 | ( .50) | 18 |
| | | 3.64 | 3.77 | | | |

Analysis of Variance Summary Table

| Source | DF | SS | MS | F |
|---|---|---|---|---|
| Between | | | | |
| Group | 1 | .029 | .029 | .046 |
| Error (B) | 33 | 20.804 | .630 | |
| Within | | | | |
| Time | 1 | .298 | .298 | 1.215 |
| Group X Time | 1 | .393 | .393 | 1.599 |
| Error (W) | 33 | 8.105 | .246 | |
| Total | 69 | 29.628 | .429 | |

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TABLE 6

EDUCATOR'S REPORT FORM: IN-HOME PROGRAM

(COHORT D: N=35)

| Item | Pre, $T_1$ | | Post, $T_2$ | | Difference | | $t$ |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean Gain GPI | $S_D$ | |
| Mother's Behavior | | | | | | | |
| Involvement in Lesson | 15.19 | 3.03 | 17.79 | 3.08 | 2.60(.52) | .66 | 3.94** |
| Sensitivity to Child | 17.50 | 3.56 | 19.39 | 3.19 | 1.89(.38) | .68 | 2.75** |
| Responsibility for teaching child | 13.63 | 2.62 | 16.37 | 2.38 | 2.74(.55) | .45 | 6.05** |
| Verbal skills with child | 14.80 | 3.62 | 18.26 | 4.16 | 3.46(.69) | .79 | 4.38** |
| Non-verbal interaction with child | 18.67 | 3.60 | 19.40 | 3.17 | .73(.15) | .70 | 1.04 |
| Child's Performance | 34.79 | 5.08 | 39.64 | 4.47 | 4.85(.49) | 1.02 | 4.75** |

**$p < .01$, $df=34$

GPI: Gain per item

Note: 5 items per scale for Mother data
10 items per scale for Child data

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TABLE 7

EDUCATOR'S REPORT FORM: IN-HOME PROGRAM

(COHORT F: N=27)

| Scale | Pre, $T_1$ | | Post, $T_2$ | | Difference | | $t$ |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean Gain | $S_{\bar{D}}$ | |
| Mother Behaviors | | | | | | | |
| Emotional Relationship with child | 20.26 | 5.40 | 22.52 | 3.02 | 2.26 | .84 | 2.69** |
| Teaching attitude | 19.74 | 4.08 | 21.63 | 3.38 | 1.89 | .77 | 2.47* |
| Teaching skill | 26.78 | 6.64 | 33.74 | 4.87 | 6.96 | 1.31 | 5.31** |
| Knowledge | 13.85 | 4.48 | 20.15 | 3.12 | 6.30 | 1.02 | 6.20** |

*$p < .05$, $df=26$

**$p < .01$, $df=26$

Note:

| | Gain per item |
|---|---|
| 7 items per Emotional Relationship Scale | $\bar{D}=2.26 \div 7=.32$ |
| 7 items per Teaching Attitude Scale | $1.89 \div 7=.27$ |
| 11 items per Teaching Skill Scale | $6.96 \div 11=.63$ |
| 6 items per Knowledge Scale | $6.30 \div 6=1.05$ |

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TABLE 8

COGNITIVE MEASURES ON CHILD

AT TIME 1 AND TIME 2

(COHORT D)

Cell Means

| | | MDI, $T_1$ | MDI, $T_2$ | $\bar{X}$ | SD | N |
|---|---|---|---|---|---|---|
| Group | $D_E$ | 87.4 | 96.9 | 92.1 | (12.7) | 31 |
| | $D_C$ | 89.3 | 88.5 | 88.9 | (14.8) | 28 |
| | | 88.3 | 92.9 | | | |

Analysis of Variance Summary Table

| Source | DF | SS | MS | F |
|---|---|---|---|---|
| Between | | | | |
| Group | 1 | 304.8 | 304.8 | .78 |
| Error (B) | 57 | 22226.0 | 389.9 | .00 |
| Within | | | | |
| Time | 1 | 631.6 | 631.6 | 3.19 |
| Group X Time | 1 | 791.0 | 791.0 | 3.99* |
| Error (W) | 57 | 11282.9 | 197.9 | .00 |
| Total | 117 | 35236.3 | 301.1 | .00 |

*$P < .05$



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TABLE 9

COGNITIVE MEASURES ON CHILD

AT TIME 1 AND TIME 2

(COHORT F)

Cell Means

| Group | | MDI, $T_1$ | MDI, $T_2$ | $\bar{X}$ | SD | N |
|---|---|---|---|---|---|---|
| | $F_E$ | 98.2 | 97.0 | 97.6 | 5.3 | 32 |
| | $F_C$ | 100.6 | 88.9 | 94.8 | 7.3 | 30 |
| | | 99.3 | 93.1 | | | |

Analysis of Variance Summary Table

| Source | DF | SS | MS | F |
|---|---|---|---|---|
| Between | | | | |
| Group | 1 | 250.453 | 250.453 | 2.996 |
| Error (B) | 60 | 5016.188 | 83.603 | |
| Within | | | | |
| Time | 1 | 1207.812 | 1207.812 | 18.018** |
| Group X Time | 1 | 844.766 | 844.766 | 12.602** |
| Error (W) | 60 | 4021.922 | 67.032 | |
| Total | 123 | 11341.141 | 92.204 | |

** $p < .01$



00022

TABLE 19

STANFORD-BINET IQ RESULTS

FOR CHILDREN AT END OF SECOND YEAR OF PROGRAM ($T_3$)

(COHORTS D and E)

| Cohort | | N | Mean | SD |
|---|---|---|---|---|
| $D_E$ and $E_E$ | | 36 | 98.6 | 11.2 |
| $D_C$ and $E_C$ | | 40 | 93.3 | 13.2 |
| | diff. | | + 5.3 | |
| | t | | 1.86 | |
| | | | p < .10 | |
| $E_E$ | | 16 | 97.9 | 6.38 |
| $E_C$ | | 16 | 88.2 | 8.2 |
| | diff. | | + 9.2 | |
| | t | | 3.55 | |
| | | | p < .01 | |
| $D_E$ | | 20 | 99.2 | 14.4 |
| $D_C$ | | 24 | 96.3 | 15.3 |
| | diff. | | + 2.9 | |
| | t | | 0.62 | |
| | | | p NS | |

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TABLE 11

TEST RESULTS FOR CHILDREN AT SUCCESSIVE DATA POINTS

FOR TIME 3 SUBJECTS ONLY

(COHORT D)

| Measure | $D_E$ | | | $D_C$ | | | Difference | t |
|---|---|---|---|---|---|---|---|---|
| | N | Mean | SD | N | Mean | SD | | |
| Bayley, $T_1$ | | | | | | | | |
| Age | 20 | 12.6 | 2.3 | 24 | 15.0 | 2.2 | - 2.4 | |
| PDI | 20 | 95.2 | 18.3 | 24 | 98.5 | 17.8 | - 3.3 | -0.62 |
| MDI | 20 | 84.9 | 24.4 | 24 | 87.4 | 22.7 | - 2.5 | -0.35 |
| Bayley, $T_2$ | | | | | | | | |
| Age | 19 | 22.4 | 1.7 | 24 | 25.4 | 2.1 | - 3.0 | |
| PDI | 19 | 99.5 | 8.4 | 24 | 99.7 | 12.7 | - .2 | -0.07 |
| MDI | 19 | 100.4 | 6.7 | 24 | 88.4 | 13.5 | +12.0 | 3.55** |
| S-B, $T_3$ | | | | | | | | |
| Age | 20 | 32.0 | 2.2 | 24 | 34.4 | 1.1 | - 2.4 | |
| IQ | 20 | 99.2 | 14.4 | 24 | 96.3 | 15.3 | + 2.9 | 0.62 |
| CFI, $T_3$ | | | | | | | | |
| Age | 16 | 37.2 | 1.8 | 15 | 38.2 | 1.8 | - 1.0 | |
| Form | 16 | 3.2 | 1.1 | 15 | 2.5 | 1.0 | + .7 | 2.05* |
| Non-Form | 16 | 28.9 | 7.7 | 15 | 28.1 | 7.6 | + .8 | 0.30 |
| Total | 16 | 32.1 | 8.4 | 15 | 30.5 | 7.7 | + 1.6 | 0.55 |

* $p \leq .05$
** $p \leq .01$

Bayley: Bayley Scales of Infant Development
PDI : Psycholmotor Development Index
MDI : Mental Developmental Index
S-B : Standford-Binet
CFI : Concept Familiarity Index
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TABLE 12

TEST RESULTS FOR CHILDREN PARTICIPATING

IN SECOND YEAR PROGRAM

(COHORT E)

| Measure | $E_E$ | | | $E_C$ | | | Difference | t |
|---|---|---|---|---|---|---|---|---|
| | N | Mean | SD | N | Mean | SD | | |
| Bayley, $T_2$ | | | | | | | | |
| Age (Mos.) | 16 | 24.3 | 2.0 | 16 | 25.3 | 2.3 | | |
| MDI | 16 | 78.6 | 10.5 | 16 | 82.6 | 15.5 | - 4.0 | 0.84 |
| PDI | 16 | 97.6 | 24.0 | 16 | 97.6 | 26.9 | - 0.5 | 0.05 |
| S-B, $T_3$ | | | | | | | | |
| Age (Mos.) | 16 | 30.5 | 1.63 | 16 | 31.0 | 1.51 | | |
| IQ | 16 | 97.9 | 6.38 | 16 | 88.2 | 8.2 | + 9.2 | 3.55** |
| CFI, $T_3$ | | | | | | | | |
| % Correct | 15 | 64.1 | 9.8 | 13 | 52.0 | 15.4 | +12.1 | 2.41* |

* $p < .05$

** $p < .01$

Note: Cohort E participated in the second year or In-Center program only, therefore there is no Time 1 data.

Bayley: Bayley Scales of Infant Development

MDI : Mental Developmental Index

PDI : Psychomotor Developmental Index

S-B : Stanford-Binet

CFI : Concept Familiarity Index

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# PREDICTION OF SUCCESS IN A PARENT EDUCATION PROGRAM

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# PREDICTION OF SUCCESS IN A PARENT EDUCATION PROGRAM

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Dr. Leler has just presented data supporting the effectiveness of the Houston Parent-Child Development Center's parent education program. For an ongoing intervention program such as the one described by Dr. Leler, it is necessary but insufficient to demonstrate the superiority of the experimental group over the control group. For the purposes of scientific analysis as well as program excellence it is revealing to examine the program effects on the individual participants. The question takes the form: Who benefited? In what manner are beneficial program effects distributed across individual program families?

One method of conducting such an investigation is to examine the relationship between a set of baseline or demographic variables, hereafter referred to as predictor variables, and a set of evaluative measures, hereafter referred to as outcome variables.

The correlation coefficients presented in Table 1 indicate the degree of association between six predictor variables at child age one (T1) and two outcome variables at Time Two (T2) (after one program year when the child is two years old) and between the same predictor variables and three outcome variables at T3 (after two program years at child age three) for two successive cohorts, D and F. Notice that for the control groups the correlation matrix reveals a clear pattern of expected results. More specifically, the Bayley Mental Development Index (MDI) T1 correlates moderately with MDI, T2 (.45, .27) HOME T2 (.33, .47) Stanford-Binet (S-B), T3 (.41) and correlates strongly with HOME, T3 (.72) and Concept Familiarity Index (CFI), T3 (.77). Likewise, the Bayley Psychomotor Developmental Index (PDI), T1 shows a similar trend with MDI, T2 (.64, .24) HOME, T2 (.45, .23), S-B T3 (.73), HOME T3 (.31), and CFI, T3 (.28). The demographic variables, income, mother's education and number of children, correlate moderately with the outcome variables in the expected direction as does the home environment variable, HOME, T1.



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However, for the experimental group the pattern of results is markedly dissimilar. The MDI and PDI predictors crossed with the 14 outcome measures show 5 negative correlations, and 9 moderate-low correlations, none of which are significantly different from zero. Similar results occur with the demographic predictors in which 9 of the 16 correlations show a relationship opposite to that expected--keeping in mind that one would expect number of children to correlate negatively with the outcome variables.

This lack of pattern for the experimental groups vis-a-vis the control groups can be interpreted as a differential treatment effect on the experimental group wherein those families who scored at the low end on the predictor variables scored relatively higher on the outcome variables.

Table 2 presents a more detailed look at this phenomenon. Control Ss again are presented alongside experimental Ss in order to show the differential effects of the intervention program. The basic theme of Table 2 is as follows: Given that subject A's predictor score fell in the upper or lower half of the predictor distribution, what is the probability that his outcome score will be in the upper or lower half of the outcome distribution?

Of course it would be helpful if there were some absolute criterion of success, such as there is in passing a driver's examination Thus, one could talk about predicting success or failure rather than merely predicting higher or lower scores without knowing the relationship between those scores and meaningful real life events. That concern notwithstanding, a more immediate issue presents itself. There are two MDI, T2 distributions, one for the experimental groups combined and one for the control groups combined. The control group distribution was selected as the best estimate of MDI, T2 success or failure.

Inspecting the first row of Table 2, it can be seen that for the control group, 61% of the Ss whose scores fell in the lower half of the MDI, T1 distribution also had scores in the lower half of the MDI T2 distribution. For the experimental group, however, only 19% of the Ss whose scores fell in the lower half of MDI, T1, also fell in

the lower half of MDI, T2. Line 2 shows that 43% of the control Ss who scored high at T1 scored low at T2.

These data suggest that the control group Ss who score low on MDI, T1 are more likely than not to score low on MDI, T2 and similarly Ss who score high on MDI, T1 are more likely to score high on MDI, T2. Such predictions do not hold up for the experimental group. In fact, just the opposite is true--low performers on MDI, T1 can expect to do better on MDI, T2 than high perfomers on MDI, T1, although both groups can be expected to do quite well at T2.

The PDI, T1 measure has no predictive value for the control group, but it does not replicate the MDI predictor data for the experimental group.

Income appears to be a premier predictor for both experimental and control Ss. Families with high incomes, relatively speaking, have children who do well on MDI, T2 whether they have been in the program or not.

Control children whose mothers have low education do just as well on MDI, T2 as children of more educated mothers. Experimental children appear to be slightly better off with better educated mothers.

The number of children in the family does not affect control Ss scores on MDI, T2 but it does predict high scores for those experimental subjects who have more siblings.

HOME is similar for both the experimental and control groups in that it predicts that Ss who score low on HOME, T1 will more likely score high on MDI, T2 than S's who score high on HOME, T1. This finding is in agreement with the MDI, T1, PDI, T1, and number of children for the experimental group, but it is in disagreement with the findings for the control group. Since the HOME subject pool is relatively small this result might well be spurious.

One noteworthy disadvantage of the Table 2 data presentation is

that only 20%-25% of the experimental Ss scored in the lower half of the MDI, T2 distribution, since that distribution was based on control group scores.

Table 3 presents a more detailed examination of predictor variables for the experimental Ss. High and low MDI, T2 outcome scores were redefined by basing them on the distribution of scores from experimental Ss only. The picture that emerges from the data in Table 3 is rather different from the one just discussed in Table 2.

Looking first at the four variables which on Table 2 yielded a prediction in the opposite direction to what one would expect (namely MDI, PDI, number of children, HOME), it can be seen here that the MDI, T1 and PDI, T1 predict a greater likelihoood of success on MDI, T2 for initially high scores, rather than initially low ones. Number of children and HOME show a weak trend in the same direction. Inspection of the remaining three predictor variables also reveal that Ss who score low or medium low on the predictor have a greater probability of scoring low on MDI, T2 than those Ss who scored high or medium high on the predictor. It is noteworthy that income has maintained its status as premier predictor.

The Educator's Report Form (ERF) is a behavior observation rating scale filled out by the In-Home Educator at the conclusion of every fourth lesson. It is comprised of 32 items which assess several aspects of the mother's child rearing knowledge and interaction style. ERF, T1 and ERF, T2 refer to the first and last assessments during the first program year.

Which predictor variables tell us something about mothers' child rearing styles after they have been in the program for one year? They all do, although PDI, T1 and ERF, T1 appear to be the strongest predictors.

The consistency of the predictor variables in relation to two completely different outcome variables, namely child mental development and mother child rearing style, is rather impressive. One could speculate on whether these variables have wide generality in predicting a variety of outcome measures. I believe they do. However, what

is clear is that they provide us with some information about who can be expected to do well in our program. The two outcome variable scores, Child MDI, T2 and Mother ERF, T2, will be highest when the child's MDI, T1 and PDI, T1 scores are high, when the family income is high, when the mother's education is high, when the number of children is small, and when the mother scores are high on ERF, T1 and HOME, T1.

These findings, in showing that Ss scoring high on predictor variables also score high on outcome measures, appear to be in conflict with the correlational results which showed that Ss who scored at the low end of the predictor variables scored relatively higher on the outcome variables. The answer to this pseudo-dilemma centers on the amount of change between T1 and T2 versus outcome status at T2. The results presented in Tables 1 and 2 reveal that the intervention treatment not only creates a marked dissimilarity between the experimental and control groups, but that those experimental families who have the lowest scores and therefore the most to gain from this program are indeed the ones gaining the most. That fact notwithstanding the experimental Ss who start higher and gain less, are still more likely to score higher on the outcome measures than the low starters.

TABLE 1

PREDICTOR-OUTCOME CORRELATIONAL RELATIONSHIPS FOR COHORTS D AND F AT THE END OF THE FIRST ($T_2$) AND SECOND ($T_3$) PROGRAM YEAR

| | | Outcome: $T_2$ | | | | Outcome: $T_3$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MDI | | HOME | | S-B | | HOME | | CFI | |
| Predictor | Cohort | Control | Experimental | C | E | C | E | C | E | C | E |
| MDI, $T_1$ | D | 45* | 37 | 33 | 29 | 41* | 40 | 72* | 36 | 77* | -05 |
| | F | 27 | -07 | 47* | 06 | | | | | | |
| PDI, $T_1$ | D | 64* | 30 | 45* | 18 | 73* | 36 | 31 | 29 | 28 | -24 |
| | F | 24 | -19 | 23 | -17 | | | | | | |
| Income | D | | | | | | | | | | |
| | F | 56* | 16 | 40* | 10 | | | | | | |
| Mother Education | D | 31 | 42 | 32 | -02 | 54* | -09 | 45* | 16 | 26 | -32 |
| | F | 09 | -21 | -09 | 23 | | | | | | |
| Number of Children | D | -26 | 34 | -34 | 46* | -39 | 13 | -37 | 25 | -43* | 14 |
| | F | 09 | 17 | -26 | -34 | | | | | | |
| HOME | D | | | | | | | | | | |
| | F | 21 | 08 | 56* | 27 | | | | | | |

* $p < .05$

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TABLE 2

PERCENTAGE OF LOW AND HIGH OUTCOME SCORES

CALCULATED FOR EACH LEVEL OF THE PREDICTOR VARIABLES

FOR EXPERIMENTAL AND CONTROL SUBJECTS

| Predictor | | MDI, $T_2$ | | | | | |
|---|---|---|---|---|---|---|---|
| | | Control | | | Experimental | | |
| | | Low | High | N | Low | High | N |
| MDI, $T_1$ | Low | 61% | 39% | (33) | 19% | 81% | (36) |
| | High | 43 | 57 | (37) | 26 | 74 | (31) |
| PDI, $T_1$ | Low | 54 | 46 | (26) | 21 | 79 | (34) |
| | High | 53 | 47 | (33) | 27 | 73 | (30) |
| Income | Low | 70 | 30 | (30) | 37 | 63 | (27) |
| | High | 29 | 71 | (24) | 9 | 91 | (32) |
| Mother Ed. | Low | 52 | 48 | (25) | 25 | 75 | (32) |
| | High | 52 | 48 | (29) | 20 | 80 | (30) |
| Children | More | 52 | 48 | (23) | 14 | 86 | (28) |
| | Fewer | 52 | 48 | (31) | 32 | 68 | (34) |
| HOME, $T_1$ | Low | 47 | 53 | (15) | 18 | 82 | (17) |
| | High | 60 | 40 | (15) | 27 | 73 | (15) |

Note: The MDI, $T_2$ distribution is based on control group scores only.

TABLE 3

PERCENTAGE OF LOW AND HIGH OUTCOME SCORES

CALCULATED FOR EACH LEVEL OF THE PREDICTOR VARIABLES

FOR EXPERIMENTAL SUBJECTS

| Predictor | | MDI, $T_2$ | | | ERF, $T_2$ | | |
|---|---|---|---|---|---|---|---|
| | | Low | High | N | Low | High | N |
| MDI, $T_1$ | L | 56% | 44% | (18) | 67% | 33% | (15) |
| | ML | 67 | 33 | (15) | 41 | 59 | (17) |
| | MH | 47 | 53 | (17) | 56 | 44 | (16) |
| | H | 38 | 63 | (16) | 22 | 78 | ( 9) |
| PDI, $T_1$ | L | 59 | 41 | (17) | 63 | 38 | (16) |
| | ML | 53 | 47 | (15) | 77 | 23 | (13) |
| | MH | 56 | 44 | (16) | 50 | 50 | (16) |
| | H | 31 | 69 | (16) | 21 | 79 | (14) |
| Income | L | 88 | 13 | ( 8) | 50 | 50 | ( 6) |
| | ML | 45 | 55 | (20) | 56 | 44 | (18) |
| | MH | 43 | 57 | (14) | 46 | 54 | (13) |
| | H | 31 | 69 | (16) | 38 | 62 | (13) |
| Mother Ed. | L | 59 | 41 | (17) | 65 | 35 | (17) |
| | ML | 62 | 38 | (13) | 40 | 60 | (10) |
| | MH | 40 | 60 | (15) | 50 | 50 | (12) |
| | H | 31 | 69 | (16) | 38 | 63 | (16) |
| Children | More | 53 | 47 | (15) | 64 | 36 | (14) |
| | M. More | 42 | 58 | (12) | 69 | 31 | (13) |
| | M. Fewer | 44 | 56 | (18) | 57 | 43 | (14) |
| | Fewer | 53 | 47 | (17) | 29 | 71 | (14) |
| ERF, $T_1$ | L | 55 | 45 | (11) | 77 | 23 | (13) |
| | ML | 63 | 38 | (16) | 53 | 47 | (15) |
| | MH | 37 | 64 | (16) | 38 | 62 | (16) |
| | H | 53 | 47 | (15) | 40 | 60 | (15) |
| HOME, $T_1$ | L | 25 | 75 | ( 8) | 60 | 40 | ( 5) |
| | ML | 89 | 11 | ( 9) | 50 | 50 | ( 8) |
| | MH | 43 | 57 | ( 7) | 50 | 50 | ( 6) |
| | H | 38 | 63 | ( 8) | 33 | 67 | ( 6) |

Note: L = low, H = high, M = medium.



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# CONCURRENT AND LONGITUDINAL RELATIONSHIPS BETWEEN MOTHER AND CHILD VARIABLES

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# CONCURRENT AND LONGITUDINAL RELATIONSHIPS BETWEEN MOTHER AND CHILD VARIABLES

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The basic purposes of the Parent-Child Development Center are to develop and test the educational model. It is also helpful to see which participants benefit from the parent education program. Dr. Leler's and Dr. Brandt's presentations have presented that sort of data. At the same time though, correlational analysis of the longitudinal data for the mothers and children yields very interesting information. It's interesting for two reasons. First, it clarifies the results of the comparison of groups across time by examining the relationships between variables at various points. This enables us to see if mother behaviors that affect children's development are in fact being changed by the program. Second, we are also using a number of new, not yet widely used measures, notably Betty Caldwell's Home Inventory and Frank Palmer's Concept Familiarity Index. I think that it's worthwhile to see what realtionship these measures have to the more traditional measures which we're using with the children in the sample.

Four sets of data are presented: first, the stability of mother and child measures over one-year periods; second, the concurrent and longitudinal relationships within the set of child variables over one or two years; third, concurrent and longitudinal relationships within the set of mother variables over one or two years; and finally the concurrent and longitudinal relationships between child and mother variables. The data are in the form of correlation coefficients, in Tables 1 through 6.

## Measures

Mother Measures:

1. HOME INVENTORY, a 45-item checklist of characteristics of the home environment, based primarily on observation of the mother and child in the home.



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2. Psychological Mindedness, a structured, open-ended interview with the mother about child rearing issues. Mother responses are rated on three dimensions: Affective Responsiveness (AR), Developmental Change (DC), and Behavior Shaping (BS).
3. Two attitude scales, the Traditional Family Ideology (TFI), and the Index of Achievement Values (IAV).

Child Measures:

1. Bayley Scales of Infant Development, Mental (MDI) and Motor (PDI) Scales
2. Stanford-Binet (S-B)
3. Concept Familiarity Index (CFI)
4. Receptive Language Inventory (RLI)

Presented in each table are data for all groups and for groups combined within cohorts. In many cases there are contradictions between results for the experimental and control groups. In some cases it may be that program effects for the experimental group have changed the normal relationship which one might expect, and which are found in the control group. In other instances, there is no readily available explanation.

Results

In Table 1, stability of maternal variables, the most notable result is the stability of the HOME Inventory over a one-year period. Over the age range from 2-3 and the age range from 1-2 the correlations in all groups are positive and most of them are fairly highly positive. The HOME seems to be a stable measure at least for one-year periods. On the verbal measures, the two attitude scales (TFI and IAV), show stability over one year. On the Psychological Mindedness, however, only one of the dimensions, Behavior Shaping, seems to be stable for experimental group participants. Correlations indicating stability of child variables are presented in Table 2. We obtained mixed results on the Bayley scales. In some cases there seem to be moderatley high significant correlation coefficients

between age 12 months and age 24 months Bayley scores. However, this is not a consistent finding. The Receptive Language Inventory seems to be stable over the period of 1 year.

Concurrent and longitudinal relationships among child measures are presented in Tables 3 and 4. Again, experimental and control groups are presented both separately and combined. At ages one and two, concurrent Bayley scores (MDI and PDI) are usually related to each other. At age 3, all 3 cognitive measures, the Stanford-Binet, the Concept Familiarity Index, and the Receptive Language Inventory, are related to each other. For groups combined, the relationships among those three measures are all significant. Among the longitudinal relationships, the Stanford-Binet is predicted by the PDI at age 1 and by the MDI at ages 1 and 2. The Concept Familiarity Index is predicted by the Receptive Language Inventory at age 2.

Relationships among maternal variables are presented in Table 5. Of the concurrent correlations all three Psychological Mindedness dimensions are related to each other but not to much else. The Traditional Family Ideology and the Index of Achievement Values, both attitude measures, are related to each other. Longitudinally, the Traditional Family Ideology at age 2 predicts verbal measures TFI, IAV, and Psychological Mindedness at age 3. Interestingly enough, the HOME Inventory is not related to the verbal measures, either concurrently or longitudinally.

The interrelationships of mother and child measures are presented in Table 6. Concurrently, the HOME Inventory is related to the Mental Developmental Index at age 2 and to the Concept Familiarity Index and the Stanford-Binet at age 3. The Affective Responsiveness dimension of Psychological Mindedness is concurrently related to the MDI at age 2 and to the Stanford-Binet at age 3. Longitudinally, the HOME Inventory at age 2 predicts the Stanford-Binet at age 3, and interestingly enough, the MDI at age 1 predicts the HOME Inventory at ages 2 and 3.

## Discussion

Replicated in this sample of low-income Mexican-American families are some relationships which are found in other disadvantaged groups. The child cognitive variables in the age range from 1-3 were related to each other and to measures of the home environment. This is consistent with the literature on child development in disadvantaged families.

The HOME Inventory, a behavioral measure, is more stable and more consistently related to child performance variables than the maternal verbal measures.

Research in this area should continue to focus on the observed behavior of mothers with their children and maternal reports of concrete events rather than on measures of maternal attitudes.

TABLE 1

STABILITY OF MATERNAL VARIABLES

| Measure | Group | N | Time Span | r | p |
|---|---|---|---|---|---|
| HOME Inventory | $D_E$ | 18 | 2-3 | .60 | ** |
| | $D_C$ | 22 | 2-3 | .50 | * |
| | $D_E$ & $D_C$ | 40 | 2-3 | .54 | *** |
| | $F_E$ | 32 | 1-2 | .35 | ' |
| | $F_C$ & $F_N$ | 40 | 1-2 | .56 | *** |
| | $F_E$ & $F_C$ & $F_N$ | 72 | 1-2 | .50 | *** |
| Traditional Family Ideology | $D_E$ | 20 | 2-3 | .50 | * |
| | $D_C$ | 19 | 2-3 | .61 | ** |
| | $D_E$ & $D_C$ | 39 | 2-3 | .57 | *** |
| Index of Achievement Values | $D_E$ | 20 | 2-3 | .20 | |
| | $D_C$ | 19 | 2-3 | .49 | * |
| | $D_E$ & $D_C$ | 39 | 2-3 | .47 | ** |
| Psychological Mindedness | | | | | |
| Affective Responsiveness | $D_E$ | 17 | 2-3 | .42 | ' |
| | $D_C$ | 18 | 2-3 | -.05 | |
| | $D_E$ & $D_C$ | 35 | 2-3 | .28 | |
| Developmental Change | $D_E$ | 17 | 2-3 | .57 | * |
| | $D_C$ | 18 | 2-3 | -.15 | |
| | $D_E$ & $D_C$ | 35 | 2-3 | .16 | |
| Behavior Shaping | $D_E$ | 17 | 2-3 | .61 | ** |
| | $D_C$ | 18 | 2-3 | .30 | |
| | $D_E$ & $D_C$ | 35 | 2-3 | .43 | * |

Note: ', $p < .10$; *, $p < .05$; **, $p < .01$; ***, $p < .001$.
Time span expressed in terms of child's age in years.



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TABLE 2

STABILITY OF CHILD VARIABLES

| Measure | Group | N | Time Span | r | p |
|---|---|---|---|---|---|
| Bayley MDI | $D_E$ | 32 | 1-2 | .38 | * |
| | $D_C$ | 28 | 1-2 | .43 | * |
| | $D_E$ & $D_C$ | 60 | 1-2 | .36 | ** |
| | $F_E$ | 32 | 1-2 | -.07 | |
| | $F_C$ & $F_N$ | 40 | 1-2 | .31 | ' |
| | $F_E$ & $F_C$ & $F_N$ | 72 | 1-2 | .11 | |
| Bayley PDI | $D_E$ | 32 | 1-2 | .48 | ** |
| | $D_C$ | 28 | 1-2 | -.02 | |
| | $D_E$ & $D_C$ | 60 | 1-2 | .27 | * |
| | $F_E$ | 32 | 1-2 | -.13 | |
| | $F_C$ & $F_N$ | 40 | 1-2 | .31 | ' |
| | $F_E$ & $F_C$ & $F_N$ | 72 | 1-2 | .14 | |
| Receptive Language Index | $D_E$ | 11 | 2-3 | .50 | |
| | $D_C$ | 15 | 2-3 | .83 | *** |
| | $D_E$ & $D_C$ | 26 | 2-3 | .72 | *** |

Note: ', $p < .10$; *, $p < .05$; **, $p < .01$; ***, $p < .001$.
Time span expressed in terms of child's age in years.



99041

TABLE 3

CORRELATIONS BETWEEN BAYLEY SCORES AT 12 AND 24 MONTHS

Group $F_E$

N = 32

| | | $T_1$ PDI | $T_1$ MDI | $T_2$ PDI | $T_2$ MDI |
|---|---|---|---|---|---|
| $T_1$ | PDI | | | | |
| | MDI | 41* | | | |
| $T_2$ | PDI | -13 | -24 | | |
| | MDI | -19 | -07 | 24 | |

Group $D_E$

N = 34

| | | $T_1$ PDI | $T_1$ MDI | $T_2$ PDI | $T_2$ MDI |
|---|---|---|---|---|---|
| $T_1$ | PDI | | | | |
| | MDI | 69*** | | | |
| $T_2$ | PDI | 48** | 34' | | |
| | MDI | 45* | 38* | 74*** | |

Group $F_C$

N = 40

| | | $T_1$ PDI | $T_1$ MDI | $T_2$ PDI | $T_2$ MDI |
|---|---|---|---|---|---|
| $T_1$ | PDI | | | | |
| | MDI | 71*** | | | |
| $T_2$ | PDI | 31' | 27' | | |
| | MDI | 24 | 31' | 81*** | |

Group $D_C$

N = 30

| | | $T_1$ PDI | $T_1$ MDI | $T_2$ PDI | $T_2$ MDI |
|---|---|---|---|---|---|
| $T_1$ | PDI | | | | |
| | MDI | 52** | | | |
| $T_2$ | PDI | -02 | -04 | | |
| | MDI | 60** | 43* | 02 | |

Groups $F_E$, $F_C$ & $F_N$

N = 72

| | | $T_1$ PDI | $T_1$ MDI | $T_2$ PDI | $T_2$ MDI |
|---|---|---|---|---|---|
| $T_1$ | PDI | | | | |
| | MDI | 61*** | | | |
| $T_2$ | PDI | 14 | 07 | | |
| | MDI | 06 | 11 | 64*** | |

Groups $D_E$ & $D_C$

N = 64

| | | $T_1$ PDI | $T_1$ MDI | $T_2$ PDI | $T_2$ MDI |
|---|---|---|---|---|---|
| $T_1$ | PDI | | | | |
| | MDI | 61*** | | | |
| $T_2$ | PDI | 27* | 16 | | |
| | MDI | 40** | 36** | 27* | |

8-74

TABLE 4

CORRELATIONS BETWEEN CHILD MEASURES AT 12, 24, AND 36 MONTHS

Group $D_E$

N = 16-20

| | | $T_1$ | | $T_2$ | | | $T_3$ | | |
|---|---|---|---|---|---|---|---|---|---|
| | | PDI | MDI | PDI | MDI | RLI | CFI | S-B | RLI |
| $T_1$ | PDI | | | | | | | | |
| | MDI | 69** | | | | | | | |
| $T_2$ | PDI | 28 | 19 | | | | | | |
| | MDI | 30 | 37 | 76*** | | | | | |
| | RLI | 10 | 26 | -49 | -24 | | | | |
| $T_3$ | CFI | -24 | -05 | -09 | -14 | 25 | | | |
| | S-B | 36 | 40' | 41' | 47* | -02 | 63** | | |
| | RLI | -04 | -11 | 42 | -05 | 50 | 26 | 16 | |

Group $D_C$

N = 15-24

| | | $T_1$ | | $T_2$ | | | $T_3$ | | |
|---|---|---|---|---|---|---|---|---|---|
| | | PDI | MDI | PDI | MDI | RLI | CFI | S-B | RLI |
| $T_1$ | PDI | | | | | | | | |
| | MDI | 47* | | | | | | | |
| $T_2$ | PDI | -04 | 00 | | | | | | |
| | MDI | 64** | 45* | 08 | | | | | |
| | RLI | 28 | 64** | 26 | 17 | | | | |
| $T_3$ | CFI | 28 | 76** | 08 | 49' | 68* | | | |
| | S-B | 72*** | 40' | -02 | 52* | 55* | 64* | | |
| | RLI | 68** | 72*** | 22 | 44* | 83*** | 83*** | 75*** | |

Groups $D_E$ & $D_C$

N = 31-44

| | | $T_1$ | | $T_2$ | | | $T_3$ | | |
|---|---|---|---|---|---|---|---|---|---|
| | | PDI | MDI | PDI | MDI | RLI | CFI | S-B | RLI |
| $T_1$ | PDI | | | | | | | | |
| | MDI | 58*** | | | | | | | |
| $T_2$ | PDI | 07 | 06 | | | | | | |
| | MDI | 42** | 34* | 20 | | | | | |
| | RLI | 23 | 50** | 13 | 00 | | | | |
| $T_3$ | CFI | -01 | 34' | 02 | 25 | 53*** | | | |
| | S-B | 55*** | 39** | 11 | 50** | 42* | 63*** | | |
| | RLI | 39* | 37* | 09 | 31 | 72*** | 53** | 54*** | |



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TABLE 5

CORRELATIONS BETWEEN MOTHER MEASURES AT CHILD AGES 24 AND 36 MONTHS

Group $D_E$

N = 17 to 20

| | | $T_2$ | | | | | | $T_3$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | HOME | AR | DC | BS | TFI | IAV | HOME | AR | DC | BS | TFI | IAV |
| | HOME | | | | | | | | | | | | |
| | AR | 11 | | | | | | | | | | | |
| $T_2$ | DC | -02 | 46* | | | | | | | | | | |
| | BS | 09 | 46* | 56* | | | | | | | | | |
| | TFI | 24 | 13 | 26 | 29 | | | | | | | | |
| | IAV | 07 | -05 | 06 | 06 | 35 | | | | | | | |
| | HOME | 61** | 06 | -02 | 12 | -08 | 04 | | | | | | |
| | AR | 01 | 42' | 70** | 53* | 44' | -12 | 02 | | | | | |
| $T_3$ | DC | 21 | 38 | 57* | 46' | 53* | -07 | 26 | 87*** | | | | |
| | BS | 19 | 59* | 70** | 61** | 37 | -08 | 13 | 87*** | 81*** | | | |
| | TFI | 06 | 13 | 22 | -05 | 50* | 20 | 05 | 55* | 49* | 33 | | |
| | IAV | 28 | 00 | 34 | -06 | 23 | 20 | 15 | 38 | 36 | 24 | 44' | |

90044

TABLE 5 (continued)

Group $D_C$

N = 17 to 22

| | | $T_2$ | | | | | | $T_3$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | HOME | AR | DC | BS | TFI | IAV | HOME | AR | DC | BS | TFI | IAV |
| $T_2$ | HOME | | | | | | | | | | | | |
| | AR | 44* | | | | | | | | | | | |
| | DC | -16 | 32 | | | | | | | | | | |
| | BS | 14 | 28 | 54** | | | | | | | | | |
| | TFI | 23 | -05 | -05 | 25 | | | | | | | | |
| | IAV | 12 | 29 | 48* | 64** | 53* | | | | | | | |
| $T_3$ | HOME | 52* | 20 | 12 | 22 | -02 | 08 | | | | | | |
| | AR | 25 | -05 | -38 | 01 | 62** | 33 | -15 | | | | | |
| | DC | 54* | -10 | -15 | 16 | 32 | 06 | 12 | 12 | | | | |
| | BS | 31 | 18 | -08 | 30 | 36 | 49* | -08 | 81*** | 10 | | | |
| | TFI | 42' | -13 | -28 | 21 | 65** | 44' | -07 | 47' | 30 | 36 | | |
| | IAV | 03 | -15 | -31 | 11 | 54* | 51* | 00 | 60** | 19 | 50* | 62** | |

00045

TABLE 5 (continued)

Groups $D_E$ & $D_C$

N = 34 to 42

| | | $T_2$ | | | | | | $T_3$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | HOME | AR | DC | BS | TFI | IAV | HOME | AR | DC | BS | TFI | IAV |
| $T_2$ | HOME | | | | | | | | | | | | |
| | AR | 25 | | | | | | | | | | | |
| | DC | -12 | 34* | | | | | | | | | | |
| | BS | 10 | 37* | 55*** | | | | | | | | | |
| | TFI | 23 | 05 | 09 | 30' | | | | | | | | |
| | IAV | 10 | 13 | 43** | 43** | 51** | | | | | | | |
| $T_3$ | HOME | 56*** | 12 | 07 | 18 | -04 | 07 | | | | | | |
| | AR | 11 | 28 | 14 | 29' | 48** | 09 | -05 | | | | | |
| | DC | 29' | 24 | 16 | 28 | 35* | -12 | 17 | 67*** | | | | |
| | BS | 25 | 43** | 21 | 43** | 33' | 18 | 02 | 84*** | 59*** | | | |
| | TFI | 25 | 04 | -07 | 09 | 60*** | 40* | -02 | 49** | 34' | 33' | | |
| | IAV | 14 | -04 | -04 | 06 | 43** | 47** | 06 | 43* | 16 | 33' | 56*** | |

Note: ', $p < .10$; *, $p < .05$; **, $p < .01$, ***, $p < .001$.

00046

TABLE 6

CORRELATIONS BETWEEN MOTHER MEASURES AND CHILD MEASURES

AT CHILD AGE 12, 24, AND 36 MONTHS

Group $D_E$

N = 14-20

| | | $T_1$ | | $T_2$ | | | $T_3$ | | |
|---|---|---|---|---|---|---|---|---|---|
| | | PDI | MDI | PDI | MDI | RLI | CFI | S-B | RLI |
| $T_2$ | HOME | 17 | 28 | 22 | 25 | -33 | 02 | 26 | -32 |
| | AR | 06 | 06 | 35 | 42' | -38 | -29 | -08 | -21 |
| | DC | 08 | -04 | 26 | 19 | -31 | -04 | 32 | 16 |
| | BS | -18 | -19 | 36 | 27 | 13 | 35 | 31 | 10 |
| | TFI | -32 | -10 | 55* | 40' | -62* | 06 | 30 | -11 |
| | IAV | -16 | -10 | 11 | -04 | -08 | -03 | 05 | -21 |
| $T_3$ | HOME | 29 | 36 | -06 | 28 | -08 | 25 | 52* | 13 |
| | AR | 01 | 24 | 36 | 23 | -22 | 19 | 30 | 11 |
| | DC | -02 | 26 | 44' | 40 | -44 | 36 | 55* | 08 |
| | BS | -10 | 13 | 33 | 32 | -20 | 15 | 29 | -03 |
| | TFI | -22 | 05 | 14 | 01 | -52' | 17 | 01 | 04 |
| | IAV | 32 | 52* | 31 | 37 | -26 | -03 | 23 | -26 |

Group $D_C$

N = 15-23

| | | $T_1$ | | $T_2$ | | | $T_3$ | | |
|---|---|---|---|---|---|---|---|---|---|
| | | PDI | MDI | PDI | MDI | RLI | CFI | S-B | RLI |
| $T_2$ | HOME | 50* | 43* | 12 | 41' | 54* | 50' | 53** | 64** |
| | AR | 45* | 24 | 12 | 66** | 26 | 49' | 47* | 45* |
| | DC | 39' | 32 | -16 | 30 | -06 | -07 | 17 | 14 |
| | BS | 56** | 51 | -03 | 33 | 21 | 28 | 40' | 59** |
| | TFI | 50* | -15 | 07 | 25 | -27 | -22 | 42' | 24 |
| | IAV | 58** | 14 | -22 | 26 | -07 | 00 | 44* | 39 |
| $T_3$ | HOME | 27 | 71*** | 05 | 26 | 67** | 45' | 29 | 63** |
| | AR | 33 | -23 | 02 | 02 | -03 | 12 | 46' | 20 |
| | DC | 22 | 18 | 10 | 08 | 24 | 01 | 15 | 34 |
| | BS | 44' | 00 | -01 | 10 | 19 | 34 | 68** | 40 |
| | TFI | 36 | 07 | -07 | 10 | -30 | -15 | 25 | 26 |
| | IAV | 26 | 02 | -26 | 08 | -15 | 26 | 46* | 30 |

TABLE 6 (continued)

Groups $D_E$ & $D_C$

N = 29-43

| | | $T_1$ | | $T_2$ | | | | $T_3$ | |
|---|---|---|---|---|---|---|---|---|---|
| | | PDI | MDI | PDI | MDI | RLI | CFI | S-B | RLI |
| $T_2$ | HOME | 36* | 36* | 15 | 33* | 26 | 26 | 42** | 28' |
| | AR | 22 | 14 | 21 | 43** | 02 | -06 | 14 | 10 |
| | DC | 27' | 18 | -06 | 15 | -07 | -08 | 17 | 11 |
| | BS | 20 | 18 | 10 | 17 | 20 | 30 | 31* | 35* |
| | TFI | 15 | -10 | 23 | 13 | -28 | -07 | 34* | 10 |
| | IAV | 33* | 08 | -13 | -02 | 03 | -04 | 25 | 20 |
| $T_3$ | HOME | 27' | 56*** | 02 | 25 | 49* | 38* | 38* | 48** |
| | AR | 13 | 05 | 17 | 10 | -05 | 16 | 34* | 14 |
| | DC | 01 | 19 | 23 | 29' | -08 | 30 | 40* | 16 |
| | BS | 14 | 06 | 12 | 20 | 08 | 23 | 49** | 20 |
| | TFI | 10 | -01 | 00 | -02 | -31 | 01 | 13 | 20 |
| | IAV | 30' | 24 | -09 | 02 | -15 | 09 | 33* | 17 |

Note: ', $p < .10$; *, $p < .05$; **, $p < .01$; ***, $p < .001$.